1.

(a) cellular concept:

把訊號覆蓋區域分為一個個的小區，可以是六邊形，正方形，圓形，通常是六角蜂窩狀，每個分區被分配多個頻率(f1-f6),具相應的基地站，在其他分區可使用重複的頻率，相鄰不使用相同頻率

(b) high-tier PCS:高階 personal commucation service

(c) Co-channel interference: 同 channel 的干擾

(d) Frequency reuse: 兩 cell(use same frequency)相距夠遠，信號強度不互相干擾

(e) IMSI: international mobile station identity

(f) MSISDN: mobile station ISDN number

2.

Someone says that almost all distributed schemes are packet mode. Is it true? Why or why not?

True, distributed scheme 的所有 node 有相同的存取權，但不能指配資源，circuit mode 需指派資源，所以不採用 circuit mode ,而採用 packet mode

3.

What are the major differences between Aloha and slotted Aloha?

Slotted aloha:

Slotted aloha 的 capacity 是 aloha 的兩倍

Halves window of vulnerability

4. List and briefly describe all possible databases for GSM networks.

VLR:

Stores the data

Subscriber data:

IMSI and MSISDN

Parameter for supplementary services

Tracking and routing information

LAI (paging and call set-up) TMSI(temporary mobile station identity) MSRN

HLR: has entries for every subscriber in the network

stores subscriber data:

IMSI and MSISDN

Parameters for additional services

Services restrictions (roaming restrctions)

Authentication data

Tracking and routing information:
Current VLR address and MSC address
Mobile station roaming number(MSRN)

5. (a) What is called Frequency Division Duplex? (b) What is called Time Division Duplex? (c) Compare and Describe their difference.

(a) 上傳 下載 分處不同頻段同時進行
(b) 上傳 下載 在同一頻段上 按照時間分配交叉進行
(c) TDD 可以更好利用頻譜資源
更易於布置
FDD 數據傳輸能力較強
對頻譜資源的要求較高
=>TDD 省資源，FDD 速度快
TDD 適合熱點覆蓋 適合建設在人口密集區域，頻段資源較緊張

TDD 在上行方面受限，基站覆蓋範圍小於 FDD，因此，在非熱點的在廣覆蓋區域（城郊、鄉鎮和公路）上，TDD 需要比 FDD 建設更多基站，成本也更高。

參考: http://www.ifuun.com/a2016613149955/